

HYGIENIC BUILDING ASSESSMENT AND SPIRAL FREEZER DESIGN ANALYSIS

ABOUT THE CLIENT

EAD helps a leading provider of ingredients and agricultural solutions enhance the sustainability of the world food chain, supporting their facilities with multi-discipline engineering, project management, and construction management solutions.



SERVICES

Mechanical & Process Engineering
Safety Consulting
Project Management

HIGHLIGHTS

- Developed hygienic assessments that identified food safety risks and provided solutions for remediation to meet high facility safety standards
- Analyzed spiral freezers and developed engineering recommendations to align with food safety and hygienic design best practices
- Delivered comprehensive report with actionable solutions that client has implemented to improve site safety and sanitation

PROBLEM TO SOLVE

The manufacturer turned to EAD's process and mechanical engineering design experts to help maintain their high standards for safety and cleanliness. We were tasked with identifying and assessing potential risks to food safety as part of a facility-wide building hygienic assessment. Since the manufacturer depends heavily on spiral freezers to prevent moisture loss, preserve quality, and extend the shelf life of their baked goods product lines, they also requested a freezer assessment to ensure alignment with food safety and hygienic design best practices.

APPROACH & SOLUTION

Drawing from our expertise in hygienic design principles and food industry experience, EAD conducted a thorough analysis of the manufacturing facility. We investigated all site systems (including drainage, HVAC, and flooring) based on the client-supplied standards. We hydro-cleaned drain lines, and video-scoped the interiors of drain systems to inspect for damage and other deficiencies. We also investigated dock areas, lighting, and the building utilities. In each location where we identified a potential food safety hazard or non-conformity, we provided details on the critical findings, suggested solutions for remediation, and recommended a time frame to resolve the hazard. Hazards were ranked based on the probability of occurrence and the potential severity of adverse consequences if not properly addressed.

In the spiral freezer assessment, EAD analyzed the manufacturer's three spiral freezers, identifying deficiencies in the original design through HVAC capacity calculations and other engineering analysis methodologies. We utilized thermal image scanning on the exterior surfaces of each spiral freezer enclosure to identify areas with cooling losses. Temperature data of the walls, inlets, discharge, and other facility locations were collected using a FLIR camera. EAD leveraged the data to identify locations within the facility with the greatest impact to the overall efficiency of the spiral freezer. The FLIR thermal imaging technology identified areas with large temperature differentials and hot air leaks. We also analyzed the construction of the freezer walls to find opportunities for improvement, and we calculated the heat transfer, air psychometrics, and mass/energy balance to identify and develop solutions to deficiencies in the spiral freezer design. The data was then compared against hygienic design codes and standards.



PROJECT EXPERIENCE HYGIENIC BUILDING ASSESSMENT AND SPIRAL FREEZER DESIGN ANALYSIS (CONTINUED)

Upon completion of the site investigation and data analysis, our insights and solutions were collected into a custom report deliverable with our site observations, engineering calculations, risk assessment, recommended engineering solutions, and cost estimate.

RESULT & BENEFIT

The spiral freezer and building assessments identified food safety hazards and freezer design deficiencies at the manufacturing facility. Our client informed us that they were impressed with how well we coordinated with their project team and the depth and detail of the final report deliverable. Since project completion, they have implemented many of our recommendations, enhancing the safety and sanitation of their facility and manufacturing operation.

